Paper No. 32

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte MIKSA DE SORGO

Appeal No. 2003-0672
Application No. 09/151,886[1]

ON BRIEF

Before COHEN, McQUADE, and NASE, Administrative Patent Judges.
NASE, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the refusal of the examiner to allow claims 1, 3 to 6, 9 to 12, 16, 18 to 21, 24 to 27, 31, 33 to 36 and 39 to 42, as amended subsequent to the final rejection. These claims constitute all of the claims pending in this application.

We REVERSE.

[1] This application was previously before the Board of Patent Appeals and Interferences in Appeal No. 2001-0468, decided September 21, 2001.

BACKGROUND

The appellant's invention relates to a non-electrically conductive, low profile thermal dissipator for attachment to the heat transfer surface of an electronic component for the conductive and/or convective cooling of the component (specification, p. 1). A copy of the claims under appeal is set forth in the appendix to the appellant's brief.

The prior art references of record relied upon by the examiner in rejecting the appealed claims are:

Kurokawa	5,291,064	March 1, 1994
Kesel	5,550,326	Aug. 27, 1996
Dumoulin et al. (Dumoulin)	WO 97/15078[2]	Apr. 24, 1997

IBM Technical Disclosure Bulletin, "Aluminum Nitride Heat Sink to the Chip," TDB-ACC-NO: NA9001182; Volume 32, Issue No. 8A, pages 182-183; January 1, 1990 (IBM TDB No. NA9001182)

Claims 1, 3 to 6, 9 to 12, 16, 18 to 21, 24 to 27, 31, 33 to 36 and 39 to 42 stand rejected under 35 U.S.C. § 103 as being unpatentable over the combined teachings of Kesel and IBM TDB No. NA9001182, further in view of Kurokawa and Dumoulin.

[2] In determining the teachings of Dumoulin, we will rely on, as did the examiner, U.S. Patent No. 6,122,172.

Rather than reiterate the conflicting viewpoints advanced by the examiner and the appellant regarding the above-noted rejection, we make reference to the answer (Paper No. 28, mailed September 24, 2002) for the examiner's complete reasoning in support of the rejection, and to the brief (Paper No. 27, filed August 12, 2002) and reply brief (Paper No. 29, filed December 3, 2002) for the appellant's arguments thereagainst.

OPINION

In reaching our decision in this appeal, we have given careful consideration to the appellant's specification and claims, to the applied prior art references, and to the respective positions articulated by the appellant and the examiner. Upon evaluation of all the evidence before us, it is our conclusion that the evidence adduced by the examiner is insufficient to establish a prima facie case of obviousness with respect to the claims under appeal. Accordingly, we will not sustain the examiner's rejection of claims 1, 3 to 6, 9 to 12, 16, 18 to 21, 24 to 27, 31, 33 to 36 and 39 to 42 under 35 U.S.C. § 103. Our reasoning for this determination follows.

In rejecting claims under 35 U.S.C. § 103, the examiner bears the initial burden of presenting a prima facie case of obviousness. See In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993). A prima facie case of obviousness is

established by presenting evidence that would have led one of ordinary skill in the art to combine the relevant teachings of the references to arrive at the claimed invention. See In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988) and In re Lintner, 458 F.2d 1013, 1016, 173 USPQ 560, 562 (CCPA 1972). While obviousness is tested by what the combined teachings of the applied prior art would have suggested to one of ordinary skill in the art (see In re Keller, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981)), obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. See ACS Hosp. Sys., Inc. v. Montefiore Hosp., 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

The appellant argues that the applied prior art does not suggest the claimed subject matter. We agree.

All the claims under appeal require a generally planar thermal dissipation member formed of a thermally conductive, electrically-nonconductive ceramic material having a thickness of less than about 100 mils (2.5 mm), wherein the ceramic material is aluminum oxide (i.e., alumina), and wherein the outer periphery of the thermal dissipation member extends generally coterminously with or within the margins of the second heat transfer surface of the source. However, these limitations are not

suggested by the applied prior art. In fact, the advantages of utilizing a thermally conductive, electrically-nonconductive ceramic aluminum oxide material having a thickness of less than about 100 mils (2.5 mm) which extends generally coterminously with or within the margins of the second heat transfer surface of the source in a thermal dissipator are not appreciated by the prior art applied by the examiner.

Kesel teaches a generally planar thermal dissipation member formed of a thermally conductive, electrically-conductive material (i.e., the metal sheet 1) having a thickness of less than about 100 mils (2.5 mm). Kesel further teaches (column 4, lines 19-27) that:

> The size of the dissipator is not critical except that it be sufficiently large so as to provide adequate dissipation. Sizes depend upon the shape and size of the component as well as the dissipator. Typically, the size will cover an area of from 0.5 sq. inch to about 6 square inches. When in the preferred rectangular shape, the dissipators will vary in size from about 0.5 by 1 inch to 1.5 by 4 inches. Of course the greater the area of thermal dissipator, the greater the ability of the dissipator to eliminate unwanted heat.

Kesel does not teach or suggest using a generally planar thermal dissipation member formed of a thermally conductive, electrically-nonconductive ceramic aluminum oxide material having a thickness of less than about 100 mils (2.5 mm) which extends generally coterminously with or within the margins of the second heat transfer surface of the source.

IBM TDB No. NA9001182 teaches using an aluminum nitride ceramic with a thickness of 60 mils cut to the size of the chip as a heat material that is adhesively bonded to the back of a silicon chip mounted on a substrate. IBM TDB No. NA9001182 also teaches that current alumina cermamic cannot complete heat removal from the chips and that the perferred material for the heat sink is aluminum nitride which offers thermal conductivity close to aluminum metal and a matched thermal expansion coefficient with the chip. IBM TDB No. NA9001182 does not teach or suggest using a generally planar thermal dissipation member formed of a thermally conductive, electrically-nonconductive ceramic aluminum oxide material having a thickness of less than about 100 mils (2.5 mm) which extends generally coterminously with or within the margins of the second heat transfer surface of the source.

Kurokawa discloses a high density, high heat dissipating, high reliable package structure for semiconductor devices. Kurokawa teaches (column 3, lines 20-28) that:

> The heat sink can be formed of a single substance material or a composite material, such as aluminum nitride, aluminum carbide, alumina, boron nitride, beryllium oxide, silicon, diamond, copper, tungsten, aluminum, since these materials have a good heat conductivity and therefore are preferable from the total viewpoint of a heat dissipation property and a connection reliability. However, the heat sink is in no way limited to the materials mentioned above.

As shown in the drawings, the heat sink is larger than chip. Kurokawa does not teach or suggest using a generally planar thermal dissipation member formed of a thermally conductive, electrically-nonconductive ceramic aluminum oxide material having a

thickness of less than about 100 mils (2.5 mm) which extends generally coterminously with or within the margins of the second heat transfer surface of the source.

Dumoulin discloses injection-molded substrates that carry electrical connections and that are equipped with heat sinks. Dumoulin teaches (column 3, lines 4-14) that:

> In an embodiment, it is particularly advantageous for the heat sink to be composed of metal, or alloys including chromium, nickel or a mixture thereof which allow good thermal conductivity with low thermal expansion at the same time.
>
> In an embodiment, a heat sink composed of ceramic can also successfully be used, in this case, in an embodiment, the heat sink preferably being composed, in particular, of aluminum oxide. Such ceramic materials also ensure good thermal conductivity with low thermal expansion at the same time.

As shown in the drawings, the heat sink is larger than chip. Dumoulin does not teach or suggest using a generally planar thermal dissipation member formed of a thermally conductive, electrically-nonconductive ceramic aluminum oxide material having a thickness of less than about 100 mils (2.5 mm) which extends generally coterminously with or within the margins of the second heat transfer surface of the source.

While each of the features claimed by the appellant may have been known at the time the invention was made to a person of ordinary skill in the art from the combined teachings of the applied prior art, it is our opinion that the claimed subject matter as a whole would not have been suggested by the applied prior art since that art does not

suggest a generally planar thermal dissipation member formed of a thermally conductive, electrically-nonconductive ceramic aluminum oxide material having a thickness of less than about 100 mils (2.5 mm) which extends generally coterminously with or within the margins of the second heat transfer surface of the source. A critical step in analyzing the patentability of claims pursuant to 35 U.S.C. § 103 is casting the mind back to the time of invention, to consider the thinking of one of ordinary skill in the art, guided only by the prior art references and the then-accepted wisdom in the field. See In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Close adherence to this methodology is especially important in cases where the very ease with which the invention can be understood may prompt one "to fall victim to the insidious effect of a hindsight syndrome wherein that which only the invention taught is used against its teacher." Id. (quoting W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed. Cir. 1983)).

Most if not all inventions arise from a combination of old elements. See In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457 (Fed. Cir. 1998). Thus, every element of a claimed invention may often be found in the prior art. See id. However, identification in the prior art of each individual part claimed is insufficient to defeat patentability of the whole claimed invention. See id. Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some

motivation, suggestion or teaching of the desirability of making the specific combination that was made by the appellant. See In re Dance, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984).

In our view, the only suggestion for modifying the applied prior art in the manner proposed by the examiner to arrive at the claimed invention stems from hindsight knowledge derived from the appellant's own disclosure. The use of such hindsight knowledge to support an obviousness rejection under 35 U.S.C. § 103 is, of course, impermissible. See, for example, W. L. Gore and Assocs., Inc. v. Garlock, Inc., supra. It follows that we cannot sustain the examiner's rejections of claims 1, 3 to 6, 9 to 12, 16, 18 to 21, 24 to 27, 31, 33 to 36 and 39 to 42.

CONCLUSION

To summarize, the decision of the examiner to reject claims 1, 3 to 6, 9 to 12, 16, 18 to 21, 24 to 27, 31, 33 to 36 and 39 to 42 under 35 U.S.C. § 103 is reversed.

REVERSED

IRWIN CHARLES COHEN Administrative Patent Judge	)
JOHN P. McQUADE Administrative Patent Judge	) BOARD OF PATENT) APPEALS) AND) INTERFERENCES
JEFFREY V. NASE Administrative Patent Judge	)

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